

Overview of dysphonia

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BASED ON THREE ARTICLES

Overview of articles:

- "Surgical vs. Non-surgical Interventions for Vocal Cord Nodules" (1)
- "Acid Reflux Treatment for Hoarseness (Review)" (2)
- "Laryngopharyngeal Reflux – A Randomized Clinical Controlled Trial" (3)

Causes of dysphonia:

- Hoarseness/dysphonia is a common cause of referral to otorhinolaryngology
- There are many causes of hoarseness/dysphonia from inflammation to neuromuscular:
 - **In 92% of patients with reflux laryngitis dysphonia is present as a symptom**
 - A study already from 2000 (Koufman) showed that 55% of patients with dysphonia have laryngopharyngeal reflux
 - Dysphonia can be caused by malignancy, vocal cord nodules, vocal cord palsy, cysts, polyps laryngitis and functional disorders such as muscle tension dysphonia

Vocal Cord Nodules

- Vocal cord nodules are bilateral, benign, calous-like growths of the mid-portion of the membranous vocal folds of variable size
- They are characterized by a thickening of the epithelium along with a variable degree of inflammation
- They characteristically produce hoarseness, discomfort and an unstable voice when speaking or singing
- A search was conducted and as selection criteria randomized and quasi-randomized trials comparing any surgical intervention for vocal cord nodules with non-surgical treatment or no treatment

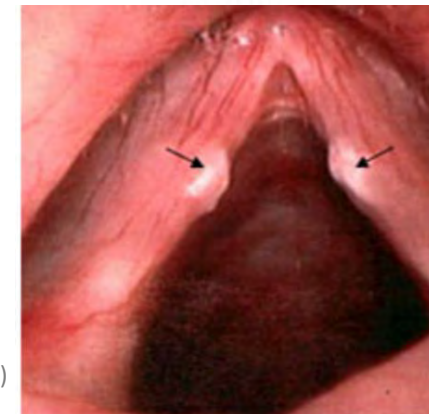


Normal



Vocal Nodules

(4)



(5)



(6)

Dysphonia caused by vocal nodules:

- Vocal nodules cause hoarseness/dysphonia, throat discomfort and pain
- They can affect the quality of life in professional singers
- Nodules were found in 25% of hoarse singers
- The aetiology is not known, but is thought to be because of:
 - "voice abuse"
 - psychological factors
 - medical factors such as reflux, infection and allergy

Diagnosing Reflux:

1. Evaluation of the *gastro-oesophageal* reflux disease
2. Evaluation of the mucosal injury.
3. Flexible fiber-optic oesophagoscopy to grade the oesophagitis and hernia if present.

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1. Evaluation of the presence of *laryngopharyngeal* reflux
 2. Evaluation of the mucosal injury: Laryngoscopy (i.e. flexible, rigid or mirror, with or without high speed film and stroboscopy) .
 3. Objective evaluation of voice disability (including acoustic measurements of fundamental frequency, jitter, intensity with shimmer, signal to noise ratio and spectral analysis).

Surgical versus Non-surgical Interventions for Vocal Cord Nodules:

- Endoscopic laryngeal examination is used for diagnosis
- Highspeed film and stroboscope examination can give further information
- Conservative non-surgical techniques have been developed and these are now considered the primary treatment of choice

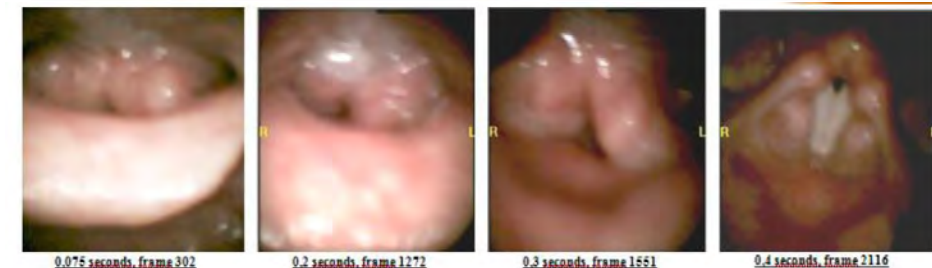
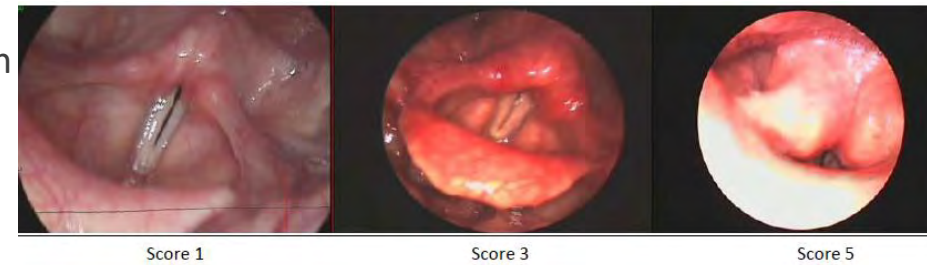
| Non-surgical | Surgical |
|---|-----------------------------------|
| Medical/pharmacological treatment of infections, allergy and reflux | Direct microsurgical techniques |
| Vocal hygiene advice | Indirect microsurgical techniques |
| Reduction of voice abuse | Laser excision |
| Voice re-training | Laser ablation |
| Voice rest | |
| Observation alone | |

Laryngopharyngeal Reflux – LPR:

- A randomized clinical controlled trial was made in 2012, which examined the treatments of LPR
- The following treatments were compared:
 - **Lifestyle advice**
 - **Lifestyle advice combined with proton pump inhibitors (PPIs)**
 - **Lifestyle advice combined with PPIs and alginate**
- The trial was based on subjective complaints from the patients participating
 - Inclusion criteria: patients with scores of 1-5 of edema of the inter-arytenoids on the RSI, and documented with objective high speed films with 4000 frames pr. second
- Results:
 - A total of 237 patients were examined
 - The differences between the three groups were not statistically significant
 - **In general there was a positive effect of treatment with disappearance of complaints after 3 months**

Acid Reflux Symptom Index – RSI:

| | | | | | | |
|--|---|---|---|---|---|---|
| Hoarseness or a problem with your voice | 0 | 1 | 2 | 3 | 4 | 5 |
| Clearing your throat | 0 | 1 | 2 | 3 | 4 | 5 |
| Excess mucous or postnasal drip | 0 | 1 | 2 | 3 | 4 | 5 |
| Difficulty swallowing food, liquids, or pills | 0 | 1 | 2 | 3 | 4 | 5 |
| Coughing after eating or after lying down | 0 | 1 | 2 | 3 | 4 | 5 |
| Breathin difficulties | 0 | 1 | 2 | 3 | 4 | 5 |
| Troublesome or annoying cough | 0 | 1 | 2 | 3 | 4 | 5 |
| Sensations of something sticking in your throat or a lump in your throat | 0 | 1 | 2 | 3 | 4 | 5 |
| Heartburn, chest pain, indigestion, or stomach acid coming up | 0 | 1 | 2 | 3 | 4 | 5 |



Visual scores:



Visual scores of oedema of the arytenoid regions on highspeed films (score 1 normal arytenoids, score 3 most often seen oedema at the first examination, score 5 nearly closed larynx due to arytenoid oedema).

Frames taken from high-speed video:



0.075 seconds, frame 302



0.2 seconds, frame 1272



0.3 seconds, frame 1551



0.4 seconds, frame 2116

Frames taken from a high-speed video set on recording 4000 pictures per second. The picture, at frame 1272 shows the appearance of mucus in the larynx, and shortly after (frame 1551) it is reduced. On frame 2116, the mucus has disappeared. The process took a total of 0.2 seconds.

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| Breathin difficulties | 0 | 1 | 2 | 3 | 4 | 5 |
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Management of Reflux:

- The options for management of laryngopharyngeal reflux disease are non-surgical.
- Lifestyle modification and patient education is the first line of treatment and includes; elevation of the bed head, individual-based dietary modifications, changing smoking habits and avoiding potentially harmful medications (Pedersen et al. 2012).
- Pharmacological treatment most commonly includes the use of proton pump inhibitors (PPIs) (omeprazole, esomeprazole, lansoprazole, pantoprazole, rabeprazole). Other drugs are seldom used. But lifestyle modification and pharmaceuticals is not better than lifestyle alone.

Conclusions:

- *"Surgical versus non-surgical interventions for vocal cord nodules"*:
 - There is no evidence from randomised controlled trials on which to base reliable conclusions about the comparative effectiveness of surgical versus non-surgical interventions
 - Nodules have a not fully understood aetiology and they are therefore hard to study and to treat
 - Nodules can have heterogenous appearance.
 - Whether or not a person finds his/hers nodules pathological is a very individual perception
 - There are no gold standard concerning objective measurements of voice treatment
 - Concerning the non-surgical part, it is clear that speech therapy is first-line of treatment, but there's no consensus to which techniques the different therapists use
 - Concerning the surgical part, there exists a general consensus that states, that the surgical treatment should aim at removing the minimum amount of mucosa from the vocal cord. Further research is needed to conclude whether cold surgical techniques are preferential to laser treatment. Although with newer surgical instruments, it is more dependent on the surgeon's skill and experience.
- *"Acid Reflux Treatment for Hoarseness" [Review]*:
 - No trials met the criteria and therefore no firm conclusion could be drawn
 - Author's conclusion is, that there is a need for high quality randomised controlled trials to evaluate the effectiveness of anti-reflux therapy for patients with dysphonia due to reflux.
- *"Laryngopharyngeal Reflux – A Randomized Clinical Controlled Trial"*:
 - Lifestyle corrections is as effective as treatment with lifestyle with and without PPI and alginates
 - Further scientific approaches are necessary
 - The study also showed that it was possible to detect differences over time using the 5 grade visual grading of the arytenoid edema of high speed films

It is clear that there is an essential need for further evidence-based research on the topic of "Dysphonia". In general it seems that lifestyle corrections, when implemented, have a high success rate.

References:

1. Pedersen M, McGlashan J. (2012) Surgical versus non-surgical interventions for vocal cord nodeules, DOI: 10.1002/14651858.CD001934.pub2.
2. Hopkins C, Yousaf U, Pedersen M. (2006). Acid reflux treatment for hoarseness [Review]. *January 2006 in the Cochrane Library Oxford, Wiley publishing. Issue 1.*
3. Pedersen M (2012) Laryngopharyngeal Reflux – A Randomized Clinical Controlled Trial. *Otolaryngol S1:004*. DOI: 10.4172/2161-199X.S1-004.
4. <http://www.voicedoctorla.com/voice-disorders/vocal-nodules-nodes/>
5. <http://www.powertosing.com/ep-101-vocal-nodule-can-singing-cause-one/>
6. <http://www.ohniww.org/voice-nodules-surgery/>
7. Reza Band UES Assist Device, "*Discussion Guide*"